

## ABSTRACT OF THE DISCLOSURE

A broad spectrum neutron detector has a thermal neutron sensitive scintillator film interleaved with a hydrogenous thermalizing media. The neutron detector has negligible sensitivity to gamma rays and produces a strong and unambiguous signal for virtually all neutrons that interact with the hydrogenous volume. The interleaving of the layers of thermal neutron sensitive phosphors helps ensure that all parts of the thermalizing volume are highly sensitive.